

Test Procedure for §170.306 (f) Exchange clinical information and summary record

This document describes the draft test procedure for evaluating conformance of complete EHRs or EHR modules to the certification criteria defined in 45 CFR Part 170 Subpart C of the Interim Final Rule (IFR) as published in the Federal Register on January 13, 2010. The document is organized by test procedure and derived test requirements with traceability to the normative certification criteria as described in the Overview document located at http://healthcare.nist.gov/docs/TestProcedureOverview_v1.pdf. These test procedures will be updated to reflect the certification criteria defined in the ONC Final Rule.

Note: This test procedure is scoped only to the criteria defined in 45 CFR Part 170 Subpart C of the Interim Final Rule (IFR) as published in the Federal Register on January 13, 2010. This test procedure will be updated to reflect updates to the criteria and standards as published in the ONC Final Rule. Questions about the criteria and standards should be directed to ONC.

CERTIFICATION CRITERIA

§170.306 (f) Exchange clinical information and summary record.

- (1) Electronically receive and display. Electronically receive a patient's summary record, from other providers and organizations including, at a minimum, diagnostic test results, problem list, medication list, medication allergy list, immunizations, procedures, and discharge summary in accordance with §170.205(a) and upon receipt of a patient summary record formatted in an alternate standard specified in §170.205(a)(1), display it in human readable format.
- (2) Electronically transmit. Enable a user to electronically transmit a patient's summary record to other providers and organizations including, at a minimum, diagnostic results, problem list, medication list, medication allergy list, immunizations, procedures, and discharge summary in accordance with:
 - (i) One of the standards specified in §170.205(a)(1);
 - (ii) The standard specified in §170.205(a)(2)(i)(A), or, at a minimum, the version of the standard specified in §170.205(a)(2)(i)(B);
 - (iii) One of the standards specified in §170.205(a)(2)(ii);
 - (iv) At a minimum, the version of the standard specified in §170.205(a)(2)(iii); and
 - (v) The standard specified in §170.205(a)(2)(iv).

INFORMATIVE TEST DESCRIPTION

This section provides an informative description of how the test procedure is organized and conducted. It is not intended to provide normative statements of the certification requirements.

This test evaluates the capability for a Complete EHR or EHR Module¹ to send and receive patient summary records, including diagnostic test results, problem list, medication list, medication allergy list, immunizations, and procedures, in the formats and vocabularies specified by the referenced standards.

¹ Department of Health and Human Services, 45 CFR Part 170 Proposed Establishment of Certification Programs for Health Information Technology, Proposed Rule, March 10, 2010.

Per the IFR criteria, the test procedure does not evaluate the capability to send and receive other types of patient information in the patient summary record.

NIST considers that the use of the CCD or CCR to convey a discharge summary is not testable without the additional constraints of an implementation guide. Per ONC guidance, conformance to the discharge summary portion of the criteria is not to be evaluated in the test procedure.

The test procedure is organized into two sections:

- Receive and Display - evaluates the capability to receive and display (render) a patient summary record in the EHR when received in HL7 CCD format and when received in ASTM CCR format. The patient summary record includes diagnostic test results, problem list, medication list, medication allergy list, immunizations, and procedures. Included in the test procedure is an evaluation of the capability of the EHR to display (render) structured data and vocabulary coded values in human-readable form
 - The Tester sends the NIST-supplied diagnostic test results, problem list, medication list, medication allergy list, immunizations, and procedures Test data formatted in HL7 CCD to the EHR
 - Using Vendor-identified EHR functions, the Tester displays the received CCD test data and validates that the rendered data is complete and presented in human readable format.
 - The Tester sends the NIST-supplied diagnostic test results, problem list, medication list, medication allergy list, immunizations, and procedures data formatted in ASTM CCR to the EHR
 - Using Vendor-identified EHR functions, the Tester validates that the rendered data is complete and presented in human readable format

Per ONC guidance, the requirement for displaying structured data and vocabulary coded values in human readable form requires that the received XML (CCD or CCR) be rendered in some way which does not display the raw XML to the user. In addition, the standardized text associated with the vocabulary coded values must be displayed to the user. There is no requirement that the actual coded values be displayed to the user, however, the Vendor may choose to do so. The Vendor may also choose to display locally defined text descriptions of the vocabulary codes, however, the standardized text must always be displayed.

- Transmit – evaluates the capability to transmit a patient summary record from the EHR in either HL7 CCD or ASTM CCR format as selected by the Vendor. The patient summary record includes diagnostic test results, problem list, medication list, medication allergy list, immunizations, and procedures. Included in the test procedure is an evaluation of the capability to communicate vocabulary coded values as defined by the referenced standards
 - Using Vendor-identified functions, the Tester enters the NIST-supplied diagnostic test results, problem list, medication list, medication allergy list, immunizations, and procedures Test data into the EHR
 - The Tester transmits the Patient Summary Record from the EHR to a NIST test tool in the format selected by the Vendor (either HL7 CCD or ASTM CCR)

- The Tester validates that the transmitted patient summary record is complete and in conformance

Per ONC guidance, the standards referenced in the IFR specifically allow for the use of the HL7 CDA level 2 standard when the CCD is transmitted for this criteria. For this test procedure, the Vendor may, at their discretion, transmit a conformant CDA Level 2 CCD, or a conformant CDA Level 3 CCD. If a CDA level 2 CCD is transmitted by the EHR, the NIST test tool will validate conformance with CDA level 2 CCD, and the Tester will visually inspect the received XML to verify that the correct patient data and vocabulary codes have been included. If a CDA level 3 CCD is transmitted, the NIST test tool will validate conformance with CDA level 3 CCD, and the Tester will visually inspect the received XML to verify that the correct patient data and vocabulary codes have been included. NIST will provide a link to an industry-supported style sheet which the Tester may use (not required) during the visual inspection.

REFERENCED STANDARDS

§170.205 Content exchange and vocabulary standards for exchanging electronic health information.	Regulatory Referenced Standard
(a) <u>Patient Summary Record</u> . (1) The Secretary adopts the following content exchange standards for the purposes of electronically exchanging a patient summary record or to use in creating an electronic copy of a patient summary record	
(i) <u>Standard</u> . Health Level Seven Clinical Document Architecture (CDA) Release 2, Level 2 Continuity of Care Document (CCD) (incorporated by reference in §170.299).	
(ii) <u>Alternative standard</u> . ASTM E2369 Standard Specification for Continuity of Care Record and Adjunct to ASTM E2369 (incorporated by reference in §170.299).	
(2) The Secretary adopts the following vocabulary standards for the purposes of specifying the code set, terminology, or nomenclature to use to represent health information included in a patient summary record:	
(i) Problem list	

§170.205 Content exchange and vocabulary standards for exchanging electronic health information.	Regulatory Referenced Standard
(A) <u>Standard</u> . The code set specified for the conditions specified at 45 CFR 162.1002(a)(1).	<p>45 CFR 162.1002(a)(1).</p> <p>(1) <i>International Classification of Diseases, 9th Edition, Clinical Modification, (ICD–9–CM), Volumes 1 and 2</i> (including The Official ICD–9–CM Guidelines for Coding and Reporting), as maintained and distributed by HHS, for the following conditions:</p> <ul style="list-style-type: none"> (i) Diseases. (ii) Injuries. (iii) Impairments. (iv) Other health problems and their manifestations. (v) Causes of injury, disease, impairment, or other health problems.
(B) <u>Alternative standard</u> . International Health Terminology Standards Development Organization (IHTSDO) Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT®) July 2009 version (incorporated by reference in §170.299).	
(ii) Procedures	
(A) <u>Standard</u> . The code set specified at 45 CFR 162.1002(a)(2).	<p>45 CFR 162.1002(a)(2).</p> <p>(2) <i>International Classification of Diseases, 9th Edition, Clinical Modification, Volume 3 Procedures</i> (including The Official ICD–9–CM Guidelines for Coding and Reporting), as maintained and distributed by HHS, for the following procedures or other actions taken for diseases, injuries, and impairments on hospital inpatients reported by hospitals:</p> <ul style="list-style-type: none"> (i) Prevention. (ii) Diagnosis. (iii) Treatment. (iv) Management.
(B) <u>Alternative standard</u> . The code set specified at 45 CFR 162.1002(a)(5).	<p>45 CFR 162.1002(a)(5).</p> <p>(5) The combination of <i>Health Care Financing Administration Common Procedure Coding System (HCPCS)</i>, as maintained and distributed by HHS, and <i>Current Procedural Terminology, Fourth Edition (CPT–4)</i>, as maintained and distributed by the American Medical Association, for physician services and other health care services. These services include, but are not limited to, the following:</p> <ul style="list-style-type: none"> (i) Physician services. (ii) Physical and occupational therapy services. (iii) Radiologic procedures. (iv) Clinical laboratory tests. (v) Other medical diagnostic procedures. (vi) Hearing and vision services. (vii) Transportation services including ambulance.
(iii) Laboratory orders and results	

§170.205 Content exchange and vocabulary standards for exchanging electronic health information.	Regulatory Referenced Standard
(A) <u>Standard</u> . Logical Observation Identifiers Names and Codes (LOINC®) version 2.27, when such codes were received within an electronic transaction from a laboratory (incorporated by reference in §170.299).	
(B) [Reserved]	
(iv) Medication list.	
(A) <u>Standard</u> . Any code set by an RxNorm drug data source provider that is identified by the United States National Library of Medicine as being a complete data set integrated within RxNorm.	Federal Register January 13, 2010 page 2031 footnote #17: GS - 10/01/2009 (Gold Standard Alchemy); MDDB - 10/07/2009 (Master Drug Data Base. Medi-Span, adivision of Wolters Kluwer Health); MMSL - 10/01/2009 (Multum MediSource Lexicon); MMX -09/28/2009 (Micromedex DRUGDEX); MSH - 08/17/2009 (Medical Subject Headings (MeSH));MTHFDA - 8/28/2009 (FDA National Drug Code Directory); MTHSPL - 10/28/2009 (FDA StructuredProduct Labels); NDDF - 10/02/2009 (First DataBank NDDF Plus Source Vocabulary); SNOMED CT - 07/31/2009 (SNOMED Clinical Terms (drug information) SNOMED International); VANDF - 10/07/2009 (Veterans Health Administration National Drug File).
(B) [Reserved]	

NORMATIVE TEST PROCEDURES

Derived Test Requirements

DTR170.306.f.1 – 1: Electronically Receive and Display HL7 CCD Patient Summary Record

DTR170.306.f.1 – 2: Electronically Receive and Display ASTM CCR Patient Summary Record

DTR170.306.f.2: Electronically Transmit HL7 CCD or ASTM CCR Patient Summary Record

DTR170.306.f.1 – 1: Electronically Receive and Display HL7 CCD Patient Summary Record

Required Vendor Information

VE170.306.f.1 - 1.01: Vendor shall provide communications configuration information and patient identifiers necessary to send test patient summary records in HL7 CCD format to the EHR. Vendor shall specify whether they wish to receive an HL7 CDA level 2 or level 3 CCD.

VE170.306.f.1 - 1.02: Vendor shall identify the EHR function(s) that are available to view an HL7 CCD formatted patient summary record in human readable format when received from an external source

VE170.306.f.1 - 1.03: Vendor shall identify the RxNorm-mapped medications vocabulary implemented within the EHR

Required Test Procedure

- TE170.306.f.1 - 1.01: Tester shall select patient summary record data from NIST-supplied test data sets
- TE170.306.f.1 - 1.02: Tester shall transmit the patient summary record in the Vendor-selected HL7 CCD (CDA level 2 or 3) format to the EHR
- TE170.306.f.1 - 1.03: Using the EHR function(s) identified by the Vendor and the NIST-supplied Inspection Test Guide, the Tester shall display and verify that the patient summary record test data are received in the EHR, including
- Diagnostic test results
 - Problem list
 - Medication list
 - Medication allergy list
 - Immunization list
 - Procedure list

Inspection Test Guide

- IN170.306.f.1 - 1.01: Tester shall verify that the patient summary record test data are received by the EHR
- IN170.306.f.1 - 1.02: Tester shall verify that the received patient summary record test data are complete, correct and viewable in the EHR in human readable format, and that the received test data are conformant to the referenced content and vocabulary standards, including:
- Structured data (XML) are presented to the user in narrative English language description form.
 - Diagnostic test results including the appropriate LOINC standard text for any lab results containing LOINC codes
 - Problem list including the appropriate ICD-9-CM or SNOMED-CT standard text for any problems containing ICD-9-CM or SNOMED-CT codes
 - Medication list including the appropriate medications vocabulary text based on the list of codes supplied by the Vendor in VE306.f.1 - 1.03
 - Medication allergy list (there is no requirement for allergy coded values to be transmitted)
 - Immunization list including the appropriate CVX standardized text for any immunizations containing CVX codes
 - Procedure list including the appropriate ICD-9-CM or HCPCS standard text for any procedures containing ICD-9-CM or HCPCS codes

DTR170.306.f.1 – 2: Electronically Receive and Display ASTM CCR Patient Summary Record

Required Vendor Information

- VE170.306.f.1 - 2.01: Vendor shall provide communications configuration information and patient identifiers necessary to send test patient summary records in ASTM CCR format to the EHR

VE170.306.f.1 - 2.02: Vendor shall identify the EHR function(s) that are available to view an ASTM CCR formatted patient summary record in human readable format when received from an external source

VE170.306.f.1 - 2.03: Vendor shall identify the RxNorm-mapped medications vocabulary implemented within the EHR

Required Test Procedure

TE170.306.f.1 - 2.01: Tester shall select patient summary record data from NIST-supplied test data sets

TE170.306.f.1 - 2.02: Tester shall transmit the patient summary record in ASTM CCR format to the EHR

TE170.306.f.1 - 2.03: Using the EHR function(s) identified by the Vendor and the NIST-supplied Inspection Test Guide, the Tester shall display and verify that the patient summary record test data are received in the EHR, including

- Diagnostic test results
- Problem list
- Medication list
- Medication allergy list
- Immunization list
- Procedure list

Inspection Test Guide

IN170.306.f.1 - 2.01: Tester shall verify that the patient summary record test data are received by the EHR

IN170.306.f.1 - 2.02: Tester shall verify that the received patient summary record test data are complete, correct and viewable in the EHR in ASTM CCR human readable format, and that the received test data are conformant to the referenced content and vocabulary standards including:

- Structured data (XML) are presented to the user in narrative English language description form
- Diagnostic test results including the appropriate LOINC standard text for any lab results containing LOINC codes
- Problem list including the appropriate ICD-9-CM or SNOMED-CT standard text for any problems containing IDC-9-CM or SNOMED-CT codes
- Medication list including the appropriate medications vocabulary codes based on the list of codes supplied by the Vendor in VE306.f.1 - 1.03
- Medication allergy list (there is no requirement for allergy coded values to be transmitted)
- Immunization list including the appropriate CVX standardized text for any immunizations containing CVX codes
- Procedure list including the appropriate ICD-9-CM or HCPCS standard text for any procedures containing ICD-9-CM or HCPCS codes

DTR170.306.f.2: Electronically Transmit HL7 CCD or ASTM CCR Patient Summary Record

Required Vendor Information

- VE170.306.f.2 - 01: Vendor shall identify the standard format they will use for this test (CCD or CCR)
- VE170.306.f.2 - 02: Vendor shall identify a patient with an existing record in the EHR to be used for this test
- VE170.306.f.2 - 03: Vendor shall identify the EHR function(s) available to 1) select the patient, 2) enter patient summary record data into the EHR, 3) transmit patient summary record data from the EHR to an external system in the Vendor-selected format

Required Test Procedures

- TE170.306.f.2 - 01: Tester shall select patient summary record test data from NIST-supplied test data sets
- TE170.306.f.2 - 02: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record and enter the patient summary record test data
- TE170.306.f.2 - 03: Using the EHR function(s) identified by the Vendor, the Tester shall transmit the patient summary record in the vendor-selected format to a NIST-supplied test tool as described in the Conformance Test Tools section
- TE170.306.f.2 - 04: Using the NIST-supplied test tool and the NIST-supplied Inspection Test Guide, the Tester shall verify that the patient summary record test data are transmitted correctly and without omission by the EHR, including
- Diagnostic test results
 - Problem list
 - Medication list
 - Medication allergy list
 - Immunization list
 - Procedure list

Inspection Test Guide

- IN170.306.f.2 - 01: Tester shall verify that the patient summary record test data are entered into the EHR correctly and without omission
- IN170.306.f.2 - 02: Tester shall verify that all of the patient summary record test data are stored in the patient's record, including
- Diagnostic test results
 - Problems
 - Medications
 - Medication allergies
 - Immunizations
 - Procedures
- IN170.306.f.2 - 03: Tester shall verify that the patient summary record test data are transmitted by the EHR to the NIST-supplied test tool
- IN170.306.f.2 - 04: Tester shall verify that the transmitted patient summary record test data transmitted to the NIST-supplied test tool are complete and correct, and that the

received test data are conformant to the referenced content (CCD or CCR) and vocabulary standards including:

- Diagnostic test results including the appropriate LOINC codes for any lab results transmitted
- Problem list including the appropriate ICD-9-CM or SNOMED-CT codes
- Medication list including the appropriate RxNorm medications vocabulary codes Medication allergy list (there is no requirement for allergy coded values to be transmitted)
- Immunization list including the appropriate CVX codes
- Procedure list including the appropriate ICD-9-CM or HCPCS codes

EXAMPLE TEST DATA

* indicates alternative standard code per certification criteria

Data Set #1

Patient

Name	Date/Time of Birth	Gender	Identification Number	Identification Number Type	Address/Phone
Ann Toliver	07/16/1950 14:15:12	Female	989285998	Medical Record Number	353 Wine Street, Flint, Michigan 48503 810-673-8378

Problem List

Type	ICD-9 Code	Patient Problem	Status	Date Diagnosed	Source
Diagnosis	428.0	Congestive Heart Failure	Active	02/22/2010	Fatima Goyal, MD
Diagnosis	410.90	Acute Myocardial Infarction	Resolved	09/16/2007	Fatima Goyal, MD

Type	SNOMED Code*	Patient Problem	Status	Date Diagnosed	Source
Disorder	42343007	Congestive Heart Failure	Active	02/22/2010	Fatima Goyal, MD
Disorder	57054005	Acute Myocardial Infarction	Resolved	09/16/2007	Fatima Goyal, MD

Medication List

RxNorm Code	Product	Generic Name	Brand Name	Strength	Dose	Route	Frequency	Date Started	Status	Source
201372	Medication	captopril	Capoten	25 mg	Tablet	PO	TID	02/25/2010	Active	Fatima Goyal, MD
200820	Medication	spironolactone	Aldactone	25 mg	Tablet	PO	QID	02/25/2010	Active	Fatima Goyal, MD
309888	Medication	digoxin	Lanoxin	125 mcg	Tablet	PO	QD	02/25/2010	Active	Fatima Goyal, MD

Medication Allergy List

Type	SNOMED Code	Medication/Agent	Reaction	Date Identified	Source
Drug Allergy	293586001	Aspirin	Wheezing	03/02/2007	Fatima Goyal, MD
Drug Allergy	294506009	Ampicillin	Diarrhea, nausea, vomiting	04/25/1994	Fatima Goyal, MD

Immunization List

Manufacturer	Lot Number	RxNorm Code	CVX Code	Vaccine	Route	Reaction	Date Administered	Source
Novartis	NV87356	857924	16	Influenza	IM	None	11/16/2009	Fatima Goyal, MD
Merck	873765C	854977	33	PPV	IM	None	8/20/2008	Fatima Goyal, MD

Procedure List

Type	ICD-9 Code	Procedure	Status	Date Performed	Source
Cardiac	00.66	Percutaneous transluminal coronary angioplasty	Completed	09/17/2007	Fatima Goyal, MD
Cardiac	37.21	Cardiac catheterization	Completed	10/01/2006	Fatima Goyal, MD

Type	CPT Code*	Procedure	Status	Date Performed	Source
Cardiac	92982	Percutaneous transluminal coronary angioplasty	Completed	09/17/2007	Fatima Goyal, MD
Cardiac	93501	Cardiac catheterization	Completed	10/01/2006	Fatima Goyal, MD

Diagnostic Test Results

Type	Code	Test (Normal Range)	Result	Date	Source
Imaging	87.44 ICD-9 71010 CPT-4*	Chest X-ray, PA	Enlarged cardiac silhouette, lung fields clear	02/24/2010	Fatima Goyal, MD
Imaging	87.44 ICD-9 71010 CPT-4*	Chest X-ray, PA	Enlarged cardiac silhouette, horizontal lines in the periphery of lower posterior lung fields	02/22/2010	Fatima Goyal, MD
Chemistry	2951-2 LOINC	Sodium (135–146 mg/dl)	138 mg/dl	02/24/2010	Fatima Goyal, MD
Chemistry	2823-3 LOINC	Potassium (3.5–5.3 mg/dl)	4.3 mg/dl	02/24/2010	Fatima Goyal, MD
Chemistry	2075-0 LOINC	Chloride (95-107 mEq/L)	98 mEq/L	02/24/2010	Fatima Goyal, MD
Chemistry	2951-2 LOINC	Sodium (135–146 mg/dl)	126 mg/dl	02/22/2010	Fatima Goyal, MD
Chemistry	2823-3 LOINC	Potassium (3.5–5.3 mg/dl)	3.0 mg/dl	02/22/2010	Fatima Goyal, MD
Chemistry	2075-0 LOINC	Chloride (95-107 mEq/L)	94 mEq/L	02/22/2010	Fatima Goyal, MD

Data Set #2

Patient

Name	Date/Time of Birth	Gender	Identification Number	Identification Number Type	Address/Phone
Ruth Warholde	05/20/1954 23:59:45	Female	9836469798	Medical Record Number	225 Park Street, Morton, Illinois 61550 309-354-9385

Problem List

Type	ICD-9 Code	Patient Problem	Status	Date Diagnosed	Source
Diagnosis	780.2	Syncope and collapse, vasovagal attack	Active	02/15/2010	Jackson Shoals, MD
Diagnosis	716.17	Traumatic arthropathy, left ankle	Active	02/15/2010	Jackson Shoals, MD
Diagnosis	434.91	Cerebrovascular Accident (Stroke)	Resolved	07/09/2009	Jackson Shoals, MD
Diagnosis	599.0	Urinary tract infection	Recurrent	09/22/2008	Jackson Shoals, MD
Diagnosis	496.0	Chronic Obstructive Pulmonary Disease	Chronic	08/12/2007	Jackson Shoals, MD
Symptom	401.9	Hypertension, essential	Chronic	05/16/2006	Jackson Shoals, MD

Type	SNOMED Code*	Patient Problem	Status	Date Diagnosed	Source
Disorder	398665005	Vasovagal syncope	Active	02/15/2010	Jackson Shoals, MD
Disorder	201954006	Traumatic arthropathy, left ankle	Active	02/15/2010	Jackson Shoals, MD
Disorder	230690007	Cerebrovascular Accident (Stroke)	Resolved	07/09/2009	Jackson Shoals, MD
Disorder	197927001	Recurrent urinary tract infection	Recurrent	09/22/2008	Jackson Shoals, MD
Disorder	13645005	Chronic Obstructive Lung Disease	Chronic	08/12/2007	Jackson Shoals, MD
Disorder	59621000	Essential Hypertension	Chronic	05/16/2006	Jackson Shoals, MD

Medication List

RxNorm Code	Product	Generic Name	Brand Name	Strength	Dose	Route	Frequency	Date Started	Status	Source
92325	Medication	propoxyphene napsylate and acetaminophen	Darvocet-N	100 mg	1 Tablet	PO	Q4-6hrs as needed	02/16/2010	Active	Jackson Shoals, MD
209834	Medication	docusate	Colace	100 mg	1 Capsule	PO	BID	02/16/2010	Active	Jackson Shoals, MD
205326	Medication	lisinopril	Zestril	30 mg	1 Tablet	PO	QD	07/15/2009	Active	Jackson Shoals, MD
309362	Medication	clopidogrel	Plavix	75 mg	1 Tablet	PO	QD	07/15/2009	Active	Jackson Shoals, MD
197361	Medication	Norvasc	amlodipine	5 mg	1 Tablet	PO	QD	07/15/2009	Active	Jackson Shoals, MD
539712	Medication	Macrobid	nitrofurantoin	100 mg	1 Capsule	PO	QD	09/22/2008	No Longer Active	Jackson Shoals, MD
836370	Medication	Atrovent inhaler	ipratropium bromide monohydrate	18 mcg/puff	2 puffs	By oral inhalation	QID	08/14/2007	Active	Jackson Shoals, MD
630208	Medication	Albuterol inhaler	albuterol sulfate	2.5 mg/3ml	2 puffs	By oral inhalation	Q4-6hrs as needed	08/14/2007	Active	Jackson Shoals, MD
207942	Medication	Esidrix	hydrochlorothiazide	50 mg	1 Tablet	PO	QD	05/20/2006	Active	Jackson Shoals, MD
628958	Medication	Klor-Con	potassium chloride	10 mEq	1 Tablet	PO	BID	05/20/2006	Active	Jackson Shoals, MD
884175	Medication	Catapres	clonidine hydrochloride	0.1 mg	1 Tablet	PO	BID	05/16/2006	Active	Jackson Shoals, MD
104368	Medication	Cardura	doxazosin mesylate	2 mg	1 Tablet	PO	QD	05/16/2006	Active	Jackson Shoals, MD

Medication Allergy List

Type	SNOMED Code	Medication/Agent	Reaction	Date Identified	Source
Drug Allergy	293620004	Indomethacin	Nausea, vomiting, rash, dizziness, headache	03/25/2003	Jackson Shoals, MD
Drug Allergy	91939003	Sulfonamides	Hives, photosensitivity	07/26/1999	Jackson Shoals, MD

Immunization List

Manufacturer	Lot Number	RxNorm Code	CVX Code	Vaccine	Route	Reaction	Date Administered	Source
Novartis	V357222	857924	16	Influenza	IM	None	11/16/09	Jackson Shoals, MD
Merck	W1855BB	347699	32	Meningococcal	IM	None	9/18/08	Jackson Shoals, MD
GlaxoSmithKline	HAB437T4	798424	43	Hepatitis B	IM	None	5/26/07	Jackson Shoals, MD

Procedure List

Type	ICD-9 Code	Procedure	Status	Date Performed	Source
Surgical	66.39	Bilateral tubal ligation	Completed	06/14/1990	Jackson Shoals, MD

Type	CPT Code*	Procedure	Status	Date Performed	Source
Surgical	58600	Bilateral tubal ligation	Completed	06/14/1990	Jackson Shoals, MD

Diagnostic Test Results

Type	Code	Test (Normal Range)	Result	Date	Source
Imaging	88.28 ICD-9 73600 CPT*	X-ray, left ankle		2/15/10	Jackson Shoals, MD
Imaging	89.52 ICD-9 93000 CPT*	Electrocardiogram	Normal Sinus Rhythm	2/15/10	Jackson Shoals, MD
Imaging	87.03 ICD-9 70450 CPT*	CT, head	Enlarged cardiac silhouette, lung fields clear	02/24/2010	Jackson Shoals, MD
Hematology	718-7 LOINC	Hemoglobin (male: 14-18 g/dl female: 12-16 g/dl)	13 g/dl	02/17/2010	Jackson Shoals, MD
Hematology	4544-3 LOINC	Hematocrit (male: 40-54% female: 36-48%)	38%	02/17/2010	Jackson Shoals, MD
Chemistry	2951-2 LOINC	Sodium (135–146 mg/dl)	136 mg/dl	02/17/2010	Jackson Shoals, MD
Chemistry	2823-3 LOINC	Potassium (3.5–5.3 mg/dl)	3.9 mg/dl	02/17/2010	Jackson Shoals, MD
Chemistry	14647-2 LOINC	Total cholesterol (<200 mg/dl)	190 mg/dl	9/16/09	Jackson Shoals, MD
Chemistry	14646-4 LOINC	HDL cholesterol (≥40 mg/dl)	40 mg/dl	9/16/09	Jackson Shoals, MD
Chemistry	2089-1 LOINC	LDL cholesterol (<100 mg/dl)	76 mg/dl	9/16/09	Jackson Shoals, MD
Chemistry	14927-8 LOINC	Triglycerides (<150 mg/dl)	150 mg/dl	9/16/09	Jackson Shoals, MD
Microbiology	630-4 LOINC	Urine culture, routine (Negative: No growth Positive: >10,000 CFU/ml)	Negative: No growth	10/2/08	Jackson Shoals, MD

Data Set #3

Patient

Name	Date/Time of Birth	Gender	Identification Number	Identification Number Type	Address/Phone
Lorraine Blevins	04/16/1957 20:15:35	Female	967385998	Medical Record Number	1020 Stuart Street, Morton, Illinois 61550 309-374-8938

Problem List

Type	ICD-9 Code	Patient Problem	Status	Date Diagnosed	Source
Diagnosis	715.35	Right hip osteoarthritis	Resolved	11/12/2010	Louis Randolph, MD
Finding	414.01	Coronary Artery Disease (CAD)	Chronic	05/05/2002	Louis Randolph, MD

Type	SNOMED Code*	Patient Problem	Status	Date Diagnosed	Source
Disorder	239872002	Right hip osteoarthritis	Resolved	11/12/2010	Louis Randolph, MD
Disorder	53741008	Coronary Arteriosclerosis	Chronic	05/05/2002	Louis Randolph, MD

Medication List

RxNorm Code	Product	Generic Name	Brand Name	Strength	Dose	Route	Frequency	Date Started	Status	Source
855320	Medication	Warfarin	Coumadin	3 mg	1 Tablet	PO	QD	2/15/2010	Active	Louis Randolph, MD
209613	Medication	Bisacodyl	Dulcolax	5 mg	1 Tablet	PO	QD	2/15/2010	Active	Louis Randolph, MD

Medication Allergy List

Type	SNOMED Code	Medication/Agent	Reaction	Date Identified	Source
Drug Allergy	91939003	Sulfonamides	Hives, photosensitivity	06/06/1998	Louis Randolph, MD
Drug Allergy	294506009	Ampicillin	Diarrhea, nausea, vomiting	04/25/1994	Louis Randolph, MD

Immunization List

Manufacturer	Lot Number	RxNorm Code	CVX Code	Vaccine	Route	Reaction	Date Administered	Source
Novartis	NV87356	857924	16	Influenza	IM	None	2/16/2010	Louis Randolph, MD
GLAXOSMITHKLINE	HAB89V2	798424	43	Hepatitis B	IM	None	07/20/2009	Louis Randolph, MD

Procedure List

Type	ICD-9 Code	Procedure	Status	Date Performed	Source
Surgical	81.51	Total Hip Replacement, Right	Completed	02/14/2010	Louis Randolph, MD
Cardiac	37.21	Cardiac catheterization	Completed	05/05/2002	Louis Randolph, MD

Type	CPT Code*	Procedure	Status	Date Performed	Source
Surgical	27130	Total Hip Replacement, Right	Completed	02/14/2010	Louis Randolph, MD
Cardiac	93501	Cardiac catheterization	Completed	05/05/2002	Louis Randolph, MD

Diagnostic Test Results

Type	Code	Test (Normal Range)	Result	Date	Source
Imaging	88.26 ICD-9 73510 CPT-4*	X-ray, 2 views, Right Hip	Within Expected Parameters	2/17/2010	Louis Randolph,MD
Imaging	87.44 ICD-9 71010 CPT-4*	Chest X-ray, PA	No disease is seen in the lung fields or pleura	2/17/2010	Louis Randolph,MD
Hematology	718-7 LOINC	Hemoglobin (male: 14-18 g/dl female: 12-16 g/dl)	11.2 g/dl	2/18/2010	Louis Randolph,MD
Hematology	4544-3 LOINC	Hematocrit (male: 40-54% female: 36-48%)	34%	2/18/2010	Louis Randolph,MD
Coagulation	34714-6 LOINC	Prothrombin Time/ International Normalized Ratio (PT/INR) (2.5 – 3.5)	3.1	2/18/2010	Louis Randolph,MD

CONFORMANCE TEST TOOLS

The following testing tools are available to evaluate conformance to the standards referenced in this test procedure:

- HL7 CCD – NIST provides an HL7 CCD validation tool designed specifically to support ARRA Meaningful Use Testing as described in this test procedure. The tool is available in two forms:
 - a downloadable package for local installation available at <http://xreg2.nist.gov/cda-validation/mu.html>
 - a web-accessable validator which is hosted by NIST available at <http://xreg2.nist.gov/cda-validation/mu.html>

Support for these tools is available by contacting
[Andrew McCaffrey](mailto:andrew.mccaffrey@nist.gov) (andrew.mccaffrey@nist.gov)
Computer Scientist
National Institute of Standards and Technology (NIST)
Information Technology Laboratory

- ASTM CCR – NIST is actively working with industry to identify available CCR validation tools. The test procedure will be updated as soon as the specific tool has been identified.
- HL7 CCD style sheet – HL7 provides a style sheet to render HL7 CCD structured documents as part of the CCD specifications package. Contact HL7 directly for the specification package.